

EPA Finalizes Regulations Requiring Onboard Diagnostic Systems on 2010 and Later Heavy-Duty Engines Used in Highway Applications Over 14,000 Pounds; Revisions to Onboard Diagnostic Requirements for Diesel Highway Heavy-duty Applications Under 14,000 Pounds

The U.S. Environmental Protection Agency (EPA) is promulgating regulations that will require the emission control systems of large highway diesel and gasoline trucks to be monitored for malfunctions via an onboard diagnostic system (OBD) similar to those systems that have been required on passenger cars since the mid-1990s. In addition to these requirements, EPA is requiring manufacturers to make available to the service and repair industry information necessary to perform repair and maintenance service on OBD systems and other emission-related engine components. This rule also makes changes to certain existing OBD requirements for smaller highway heavy-duty diesel trucks.

Background

- On January 18, 2001, EPA established a comprehensive national control program—the Clean Diesel Trucks and Buses program—to regulate the heavy-duty vehicle and its fuel as a single system. (66 FR 5002) As part of this

program, new emission standards for heavy-duty highway engines and vehicles began to take effect in model year 2007 and are being phased in through 2010. These standards are based on the use of high-efficiency catalytic exhaust emission control devices or comparably effective advanced technologies. Because these devices are damaged by sulfur, the program also reduces the level of sulfur in highway diesel fuel by 97 percent. The emissions reductions associated with this program are estimated to result in over \$70 billion in benefits through reduced hospitalizations and lost work days. The OBD requirements will help to ensure that these benefits are realized.

- In October of 2000, EPA published a final rule requiring OBD systems on heavy-duty vehicles and engines up to 14,000 pounds gross vehicle weight rating (GVWR) (65 FR 59896). In that rule, EPA expressed its intention to develop in a future rule OBD requirements for vehicles and engines used in vehicles over 14,000 pounds. EPA again expressed this same intention in its Clean Diesel Trucks and Buses final rule (66 FR 5002) which established new heavy-duty highway emissions standards for 2007 and later model year engines (i.e., the “2007 Highway Rule”).
- On February 19, 1993, EPA published a final rule requiring manufacturers of light-duty applications to install OBD systems on their vehicles beginning with the 1994 model year (58 FR 9468). The OBD systems must monitor emission control components for any malfunction or deterioration that could cause exceedance of certain emission thresholds. The regulation also required that the driver be notified of any need for repair via a dashboard light, or malfunction indicator light (MIL), when the diagnostic system detected a problem.
- On August 9, 1995, EPA published a final rule that established service information regulations for light-duty vehicles and light-duty trucks (60 FR 40474). These regulations, in part, required each Original Equipment Manufacturer (OEM) to list all of its emission-related service and repair information on a Web site and note how to obtain that information and at what cost. The intent being to ensure that aftermarket service and repair facilities have access to the same emission-related service information, in the same or similar manner, as that provided by OEMs to their franchised dealerships. These service information availability requirements have been revised since that first final rule in response to changing technology among other reasons. (68 FR 38428)
- In June of 2003, EPA published a final rule extending service information availability requirements to heavy-duty vehicles and engines weighing up to 14,000 pounds GVWR. EPA did not extend these requirements to engines above 14,000 pounds GVWR, deciding to wait until such engines were subject to OBD requirements.

Overview of the OBD Final Rule

In September 2008, EPA granted a waiver from federal preemption to the State of California, allowing it to implement/establish heavy-duty onboard diagnostic (HDOBD) requirements. Given the nature of the heavy-duty trucking industry in the United States and the importance of the free and open movement of goods across state borders, EPA believes that a consistent

nationwide HDOBD program is a desirable outcome. EPA has worked closely with California on the proposed rule and with both California and industry stakeholders on this final rule, in an effort to develop a consistent set of HDOBD requirements. As a result, EPA's new HDOBD program is consistent with the California program in almost all important aspects. EPA believes that, while minor differences exist between these requirements and the California requirements, we will end up with OBD systems that will be compliant with both the federal program and the California program. Issuing and implementing this final rule is an important step in EPA's efforts to work with the California Air Resources Board to develop a consistent national program.

The rule requires manufacturers to install OBD systems that monitor the functioning of emission control components and alert the vehicle operator to any detected need for emission-related repair. In addition, when a malfunction occurs, diagnostic information must be stored in the engine's computer to assist in diagnosis and repair of the malfunction. Also, manufacturers are required to make available to the service and repair industry information necessary to perform repair and maintenance service on OBD systems and other emission related engine components. All of these requirements will help to ensure that the significant benefits of EPA's 2007 and 2010 heavy-duty highway standards will be realized in-use. Specifically:

- For 2010 and later model year heavy-duty diesel and gasoline engines used in highway applications over 14,000 pounds, we are requiring that all major emissions control systems be monitored and malfunctions be detected prior to emissions exceeding a set of emissions thresholds. Most notably, we are requiring that the aftertreatment devices—e.g., the diesel particulate filters and oxides of nitrogen (NO_x) reducing catalysts—that will be used on highway diesel engines to comply with the 2010 emissions standards will be monitored and their failure will be detected and noted to the driver. We are also requiring that all emission-related electronic sensors and actuators be monitored for proper operation.
- For these highway applications over 14,000 pounds, we are requiring that one engine family per manufacturer be certified to the OBD requirements in the 2010 through 2012 model years. Beginning in 2013, all highway engines for all manufacturers would have to be certified to the OBD requirements. This phase-in is designed to spread over a number of years the development effort required of industry and to provide industry with a learning period prior to implementing the complex OBD requirements on 100 percent of their highway product line.
- For applications over 14,000 pounds, the service information availability requirements would apply for those engines certified to the OBD requirements.
- For 2010 and later model year highway heavy-duty diesel applications under 14,000 pounds, we are promulgating a new emissions threshold for monitoring of the diesel particulate filter. The existing requirement for these applications is to detect a catastrophic failure of the device. We believe that a more stringent requirement is appropriate and feasible. The emission threshold is consistent, both in stringency and in timing, with the particulate matter (PM) thresholds for over 14,000 pound applications.

- For 2007 and later model year diesel highway heavy-duty applications under 14,000 pounds, we are changing the emission thresholds for NO_x emissions. The existing thresholds, typically 1.5 times the applicable NO_x standard, were established when the engine's NO_x standard (i.e., the 2004 NO_x standard) was much higher than today's very low level (i.e., the 2010 NO_x standard). We believe these OBD thresholds are not technologically feasible in the context of EPA's very stringent NO_x emission standard, and this change addresses that issue.

Health and Environmental Effects

In our 2007 heavy-duty highway rule, we estimated that the new 2007 highway standards will result in substantial benefits to the public health and welfare through significant annual reductions in emissions of NO_x, PM, nonmethane hydrocarbons (NMHC), carbon monoxide, sulfur dioxide, and air toxics. These emission reductions will prevent 8,300 premature deaths, more than 9,500 hospitalizations, and 1.5 million work days lost. The OBD requirements will help to ensure that these projected benefits will be realized.

As a result of the 2007 highway program, each new truck and bus will be more than 90 percent cleaner than current models. We project a 2.6 million ton reduction of NO_x emissions in 2030 when the current heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with the 2007 program's emission standards. By 2030, the program will reduce annual emissions of NMHC by 115,000 tons and PM by 109,000 tons.

Ozone causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. PM is deposited deep in the lungs and causes premature death, increased emergency room visits, and increased respiratory symptoms and disease. With both ozone and PM, children and the elderly are most at risk. In addition, ozone, NO_x, and PM adversely affect the environment in various ways, including crop damage, acid rain, and visibility impairment.

We have not estimated new emissions reductions associated with this OBD rule. We consider OBD to be a critical element to an overall emissions control program. As such, OBD requirements and their associated benefits were assumed in our estimated emissions reductions associated with the 2007 highway rule.

Cost Effects

We project that the OBD requirements will result in an increased hardware cost of roughly \$60 per diesel engine and \$70 per gasoline engine used in applications over 14,000 pounds. We project that the new requirements for diesel heavy-duty applications under 14,000 pounds will have no increased hardware cost since these engines and vehicles have complied with OBD requirements since 2004.

Public Participation Opportunities

You can access the rule and related documents on EPA's Office of Transportation and Air Quality (OTAQ) Web site at: www.epa.gov/obd.

For More Information

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